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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,208	05/14/2001	Nanette C. Jensen	10013325-1	9811

7590 12/28/2004

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EXAMINER	
WEST, JEFFREY R	

ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/855,208	JENSEN ET AL.	
	Examiner	Art Unit	
	Jeffrey R. West	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 7-10, 13-16, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,902,994 to Lisson et al. in view of U.S. Patent No. 4,945,225 to Gamgee and U.S. Patent No. 6,642,492 to Shiota et al.

Lisson teaches an apparatus for calibrating a linear image sensor such as an array of sensors of a charge coupled device (column 1, lines 10-12) in a scanning apparatus (column 3, lines 1-2) including a light source (column 2, lines 61-63) controlled by a corresponding control circuit for applying first and second intensities of the light source at first and second times (column 3, lines 12-13) through the altering of voltage or current levels applied to the light source by predefined amounts (column 3, lines 42-45) to sequence the intensity of the of the light source from zero amplitude to a maximum level causing the image sensor to saturate (column 3, lines 45-49), wherein the image sensor array produces a corresponding first and second outputs based on the source intensity (column 3, lines 20-27).

While Lisson does disclose that altered currents are supplied by a control circuit to step the intensity of a light source until the saturation of the light sensor, Lisson

does not specifically include a corresponding means for determining the occurrence of the saturation or specify that the image sensor be part of a scanner apparatus comprising a processor and memory for incrementing and decrementing the driving source of an LED as the light source.

Gamgee teaches a signal discriminator including a light source and a sensing optical detector circuit that produces an output corresponding to the intensity of the light source (column 3, lines 16-25) wherein saturation of the sensing optical detector circuit is detected by producing first and second magnitude outputs, at first and second times, related to first and second light source intensities (column 2, lines 49-58) and determining when a difference between the first and second outputs are not significant as compared to a predetermined significance value/threshold (column 2, line 65 to column 3, line 11).

Shiota teaches a calibration apparatus for light emitting elements in an optical scanning printer (column 1, line 66 to column 2, line 2) comprising an optical head including an LED light source (column 3, lines 7-12) a memory storage device, a driving control logic circuit coupled to the LED light source (column 4, lines 62-65), and a processing logic circuit (column 5, line 26) wherein the LED light source is incremented and decremented predetermined amounts by a driving source to control the intensity of emitted light (column 5, lines 5-10) in accordance with the processing circuit and memory storage device logic in order to obtain the light source at a desired intensity/brightness (column 6, lines 20-25). Shiota also teaches comparing

a sensor output to a threshold to determine when the output reaches a desired value (column 5, lines 30-36).

It would have been obvious to one having ordinary skill in the art to modify the invention of Lisson to include a corresponding means for determining the occurrence of the saturation or specify that the image sensor be part of a scanner with an LED as the light source, as taught by Gamgee, because Lisson teaches altering a current supplied to a light source until saturation is detected, but provides no method for determining such saturation and the invention of Gamgee suggests that the combination would have provided a method for determining the saturation when an intensity is altered up to a saturation point (column 1, lines 61-64) by employing a common relationship (column 1, lines 64-68) thereby accurate determination of when the maximum intensity has been reached.

It would have been obvious to one having ordinary skill in the art to modify the invention of Lisson to include a processor and memory for incrementing and decrementing the driving source of an LED as the light source, as taught by Shiota, because the invention of Lisson teaches altering the driving current of a light source up to a maximum value and Shiota suggests that the combination would have provided a corresponding method for providing complete control for adjusting the driving source until the intensity output reaches a desired optimum value (column 5, lines 30-41 and 52-61).

3. Claims 5, 6, 11, 12, 17, and 18 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Lisson et al. in view of Gamgee and Shiota et al. and further in view of U.S. Patent No. 4,982,203 to Uebbing et al.

As noted above, Lisson in combination with Gamgee and Shiota teaches many of the features of the claimed invention, and while combination teaches incrementing/decrementing the current in order to obtain an optimum value, the combination does not specifically teach determining the amount the current is to be changed using percentages.

Uebbing teaches a method and apparatus for improving the uniformity of an LED printhead by compensating for the degradation in light output of a plurality of LEDs (column 4, lines 66-68) comprising obtaining the light output measures of two different pulse-width values and comparing the difference between these values to determine the percentage increase, of the second measure relative the first measure, needed to meet the desired output level deviation/difference (column 5, lines 1-22).

It would have been obvious to one having ordinary skill in the art to modify the invention of Lisson, Gamgee, and Shiota to include determining the amount the current is to be changed using percentages, as taught by Uebbing, because Uebbing suggests a method that would quickly and accurately determine the required change in intensity, and corresponding current modification, using a functionally equivalent method in order to adjust the light output to the optimum/desired value of Lisson, Gamgee, and Shiota (column 5, lines 1-32).

Response to Arguments

4. Applicant's arguments filed October 12, 2004, have been fully considered but they are not persuasive.

Applicant first argues the Examiner's interpretation of column 2, lines 49-58, of the Gamgee reference stating, "the sensing optical circuit does not produce first and second magnitude outputs at first and second times that are related to first and second light source intensities. Rather, an 'incident radiant signal 10' (presumably a radiant light) falls onto an 'incident signal sensing means 20'. The 'incident radiant signal 10' is a signal radiant signal that comprises two separate components. These components are a 'radiant information signal' (presumably a data signal) and a 'radiant background signal' (presumably noise). However, the incident signal sensing means 20 only generates an output of a single magnitude. The discriminator circuit as taught by Gamgee is employed to maintain a bias of the sensor to facilitate differentiation between the various components of the input signal to identify the information in the signal as opposed to the noise. This is seen in the statement of Gamgee where 'the sensing means 20 is sensitive to incident radiation and generates an output sensing signal 21 of a level related to the intensity of incident radiation 10'. Thus only a single output sensing signal 21 is generated by the incident radiation of the sensor described."

The Examiner asserts that column 2, lines 49-58, of Gamgee is only included to teach that the detector circuit produces magnitude outputs related to incident light source intensities, specifically, "The discriminating apparatus of FIG. 2 acts as the

detector 11 of FIG. 1 and includes an incident signal sensing means 20 sensitive to an incident radiation signal 10 comprising both radiant information signal and radiant background signal to generate and output sensing signal 21 of a level related to the level of the incident signal 10."

Applicant then argues the Examiner's interpretation of column 2 line 65 to column 3, line 11, of the Gamgee reference stating, "Gamgee discusses discrimination between an information components and a background or noise component in the same signal. There are not two measures of light output of an LED that are taken at different periods of time as described in claim 1. In addition, there is no comparison between a first measure of a light output and a second measure of a light output with a predefined different threshold. In fact, no comparison is performed. Accordingly, Applicants assert that the element of 'detecting a saturation of the sensors in the sensor array by comparing the difference between a first measure of light output and the second measure of light output with a predetermined threshold' as set forth in claim 1 is not shown or suggested by Gamgee."

The Examiner maintains that the invention of Gamgee teaches a method for detecting saturation wherein a "sensing means 20 generates, in response to incident radiation 10, an output signal 21 of magnitude related to the incident radiation level up to a saturation level of the output signal 21, beyond which saturation level, any changes in incident radiation level do not produce significant changes in magnitude of the output sensing signal 21."

Therefore Gamgee teaches that the sensing means generates a first output signal related to a first incident radiation. The sensing means then generates a second output, of a plurality of subsequent output signals, related to a second incident radiation, of a plurality of subsequent incident radiations, and repeats the process up until a saturation level is detection. The saturation level is detected by determining when a difference between the first and second incident radiation levels does not produce a significant difference between the magnitudes of the first and second output signals. Further, in order to determine whether the difference between the magnitudes of the first and second output signals, it is considered inherent that the difference must be compared to some type of threshold to indicate that the difference is not significant.

Therefore, it can be seen that Gamgee does teach detecting saturation by comparing the difference a between a first measure of light output and the second measure of light output with a predetermined significance threshold. This teaching of Gamgee is consistent with the common means for detecting saturation in that it applies steadily increasing inputs to a sensor each time comparing a difference in the outputs of the sensors with a threshold to determine when the difference in output does not correspond to the change in input.

Applicant then argues that, with respect to claims 5 and 6, the prior art does not teach "the additional step of calculating the difference by determining a percent increase or decrease of the second measure of the light output of the LED over the

first measure of the light output of the LED" because "Uebbing merely teaches measuring the light output of LEDs at two separate times to determine a degradation of light output over the time period between measurements. (See Uebbing, column 6, lines 9-24). In this respect, Uebbing is not detecting a 'percentage increase' between two measurements, but the amount of degradation in the light output. In addition, Uebbing does not suggest determining 'the percentage increase, of the second measure relative to the first measure, needed to meet the desired output level deviation/difference (in this case zero).' There is no 'desired output level deviation/difference' that is to be reached. Rather, the amount of light output degradation is determined between the measurements and the pulse width is adjusted to compensate. The difference between the measurement is not compared to anything. Consequently, Uebbing fails to show or suggest the concept of obtaining different measure of light output and comparing a difference between the measures with a predefined difference threshold as claimed in claim 1."

The Examiner asserts that the invention of Uebbing is not included in the rejection of claim 1, nor is it included to teach that the current is both increased and decreased, but is only included to teach determining the amount the current to be changed using percentages, as required in claims 5, 6, 11, 12, 17, and 18. As noted above, the combination of Lisson, Gamgee, and Shiota already teaches determining a difference between sensor output levels that is compared to a predetermined significance threshold to determine if saturation exists, as well as performing compensation by increasing and decreasing a driving signal.

Applicant also argues the motivation to combine the references because "Gamgee does not show or suggest the determination of a saturation" and the statement that 'Lisson teaches altering current supplied to a light source until saturation is detected' is incorrect."

The Examiner maintains that the invention of Gamgee does show the determination of saturation stating, "sensing means 20 generates, in response to incident radiation 10, an output signal 21 of magnitude related to the incident radiation level up to a saturation level of the output signal 21, beyond which saturation level, any changes in incident radiation level do not produce significant changes in magnitude of the output sensing signal 21" (column 3, lines 5-11) and Lisson does teach altering current supplied to a light source until saturation is detected stating "[c]ontrol electronics 22 is programmed to supply a series of predetermined signals (voltage or current) levels that step light controller 24 through a series of operations which supply appropriate electrical control signals (voltage or current) levels which provide light level magnitudes corresponding to said signals. The control electronics 22 is programmed to provide a sequence of illuminance levels ranging from zero amplitude to some maximum level (e.g. the level at which image sensor 14 reaches saturation)" (column 3, lines 40-49).

Applicant also states that "the cited motivation to combine the above cited references is illusory and non-sensical in view of the actual teachings of the cited reference. In this respect, Applicants assert that the combination of reference cited

in the Office Action can only reasonably be made with the use of impermissible hindsight construction. Given that the Office Action does not state the required motivation to combine the references, Applicant asserts that the rejection of claims 1-20 over the cited combination of references is improper."

The Examiner asserts that it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant case, motivation exists to combine the inventions of Gamgee and Lisson because, as noted above, Lisson teaches altering the current level using a sequence of applied current levels in order to obtain a sequence of illuminance levels from zero to saturation, but provides no method for determining when saturation is reached and the invention of Gamgee suggests that the combination would have provided a method for determining the saturation when an intensity is altered up to a saturation point (column 1, lines 61-64), as in Lisson, by employing a common relationship for determining saturation (column 1, lines 64-68) to accurately determine when the maximum intensity of Lission has been reached.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to

Applicant's disclosure.

U.S. Patent No. 5,495,329 to Anderson, II et al. teaches adaptive lamp control including determining a degree of which a lamp is changing by obtaining a first illumination value, a second illumination value and comparing the difference between the illumination values to a limit.

U.S. Patent No. 6,650,443 to Izumi teaches an apparatus and method for reading images and computer-readable storage medium storing an image processing program including determining when a sensing array is saturated because an output of the array does not change linearly with respect to changes in the luminance of a lamp.

U.S. Patent No. 4,408,231 to Bushaw et al. teaches a method and apparatus for calibrating a linear array scanning system including determining the saturation of a sensing array.

U.S. Patent Application Publication No. 2002/0163583 to Jones teaches a system and method for capturing color images that extends the dynamic range of an image sensor wherein the saturation point of the image sensor is defined as the maximum amount of light beyond which the electrical response of the optical detector does not change.

U.S. Patent Application Publication No. 2002/0003582 to Kadohara et al. teaches a focus state detection apparatus with sensing device controls wherein saturation is determined by comparing the difference between two output voltages to a predefined threshold.

U.S. Patent No. 6,357,658 to Garczynski et al. teaches an apparatus and methods for scanning documents including a photosensor array selected as a charge coupled device.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jrw
December 21, 2004

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